ED BURGESS SUPPLEMENTAL Q&A

RESPONSE TO WITNESS HANZLIK'S LATE-FILED COMPOSITE EXHIBIT

Q – Thank you, Mr. Burgess. Did you have an opportunity to listen to the testimony of Witness Hanzlik this week?

A. Yes.

Q. Since that testimony, have you had a chance to review the composite exhibit he and his attorneys provided after the hearing on Tuesday evening?

A. Yes.

Q. In response to that exhibit and the testimony about it, have you had a chance to prepare any further rebuttal testimony?

A. Yes I have.

Q. Are you prepared to submit that supplemental rebuttal testimony in the form of a brief Q and A?

A. Yes.

MR CHAIRMAN, we respectfully request that the supplemental rebuttal testimony of Mr. Burgess be accepted in the form of a Q & A.

Q. Please refer to Mr. Hanzlik's composite Exhibit and the graph related to August 13, 2021. Mr. Hanzlik described the drop that occurred on this day as a 48% drop is that correct?

A. Yes, that's what I believe I heard him say yesterday.

Q. From a VIC perspective, would you agree with that this chart shows a 48% drop?

A. No. While I agree that the low point of 403 MW occurring at 3:44 pm is about 48% less than the high point of 778 MW occurring at 10:01 am, this drop occurs over almost six hours, giving Dominion time to respond by identifying and committing additional operating reserves if necessary.

According to Dominion's methodology for calculating the VIC, the relevant drops are calculated on a 15-min increment. Dominion's rationale for this is that NERC's Reliability Based Control Standard or BAL-001-2 require utilities to balance their generation and load on a 30-minute

average. To be conservative, the VIC study assumes that any operating reserve shortfall must be corrected on a 15-min basis. Thus, the relevant timeframe to consider any variable integration costs – as Dominion has defined it -- is 15 minutes, not six hours.

Q. Can you explain why the difference in the 15-min and 6-hour timeframes matters?

A. Yes. While some of Dominion's generation units, like coal, take longer to turn on and might take even more than six hours, Dominion has many units that can respond very quickly, and in less than six hours. This includes about 400 MW of quick start gas turbines, and 576 MW of fast-acting pumped storage. Because these are fast-acting units, they do not necessarily need to be "turned on" ahead of time, and thus do not incur any costs to be made available for responding to unexpected drops. As Mr. Hanzlik explained, Dominion's control room operators are constantly monitoring system conditions in real time, 24/7, to respond to events as they arise. Thus, while they have options to respond quickly over a 15-min period, the system operators would have even more options to respond over a six-hour time-period. Six hours may even be long enough for slower-acting units, like combined-cycle gas plants to respond in a meaningful way.

Q. Of the six days that Dominion shows here, which one has the most significant 15-min drop in solar production?

A. August 17th shows a drop of about 251 MW occurring around 3:30 PM. I presume this is related to the predictable tropical storm weather that others have previously described.

Q. Do you know if Dominion had forecasted a drop in solar production around 3:30 pm?

A. No, since the forecast data was not provided, I have no way of knowing how the actual production compares to the expected production. The forecast data would be needed to demonstrate how much of this drop was unexpected. Keep in mind that the VIC only accounts for *unpredicted* drops, not forecasted drops, and that is a crucial distinction. I would expect that Dominion forecasted a lower level of production – even if not exact -- around the time period of the drop due to weather predictions known in advance.

Q. How does a 251 MW drop compare to the operating reserves that Guidehouse assumed in its VIC analysis for August?

A. It is significantly lower. In the Guidehouse study, the operating reserves assumed to be required to account for solar drops was 557 MW for Tranche 1 as shown on Table 11 of the study. So Guidehouse is excessively inflating the amount of operating reserves needed for solar – which is the key driver of integration costs – to more than double than what would actually be required on this particular day. Since Guidehouse applies this 557 MW assumption to all hours in the month (in PROMOD), it substantially increases the integration costs in its study relative to what is realistically required, even on an extreme day like August 17th.

Q. Do you believe a 251 MW drop is significant enough for Dominion to increase its operating reserves – which is the basis of the VIC analysis - in any meaningful way, relative to how it has operated its system in recent years?

A. No. Based on the data I reviewed from Dominion's discovery responses, the operating reserves it held in the 2016-2017 time-period – even before solar QFs were added – were over 1000 MW on average. This is just the natural outcome of how DESC has economically dispatched its system and means the system has a lot of headroom to absorb solar (at little or no cost) before new operating reserves become necessary.

In fact, based on my analysis of Dominion's data, the instances in 2016-2017 where operating reserves were less than 251 MW occurred less than 0.01% of the time.

Q. What about now after over 800 MW of solar has been added to Dominion's system?

A. Based on my review of Dominion's data in the 2020-2021 timeframe, with over 800 MW on the system, there were zero instances where operating reserves were less than 251 MW.

Even if one were to take an overly conservative approach that doubled the level of required reserves to 502 MW, I found that Dominion's actual operating reserves in the 2020-2021 timeframe only fell below that level less than 0.4% of the time that solar was operating.

So, even if Dominion took a more conservative approach than what it uses today, it might need to increase operating reserves in less than 1% of hours.

Thus, the need to significantly increase operating reserves during *all* solar production hours – that is 100% –, as the Guidehouse study recommends, is clearly incorrect and thus its VIC analysis is fundamentally flawed.

Q. The data shown in these charts provided by Mr. Hanzlik has a resolution of 1 minute correct?

A. Yes. You can see that on the chart currently shown and how squiggly the lines are.

Q. Mr. Hanzlik described this chart as a realistic picture of what he and his team must respond to in the DESC control room by ensuring there are enough operating reserves to deal with this variability. Do you agree?

A. Yes.

Q. Did you hear Mr. Hanzlik talk about the fact that the operating reserves are being consistently updated in real time over the course of the day?

A. Yes, that's my understanding.

Q. And would this minute-by-minute view provide more meaningful picture of what his team has to deal with than a monthly average value would provide?

A. Yes.

Q. Does the need to analyze the system on a minute-by-minute view, such as what Mr. Hanzlik provided yesterday in his charts, invalidate a monthly average view such as what you provided in Table 1 of your direct testimony?

A. No. I recall Mr. Hanzlik criticized the monthly average tables I provided as "meaningless" from a system operator's perspective. I agree that those monthly values do not provide precise insight into what a system operator must deal with on a minute-by-minute basis, as reflected in the charts he provided yesterday. However, I used average values to *summarize* what was going on during each minute of the data provided over the course of an entire year. It would not have been practical for me to provide a table with over 500,000 data points for the entire year, so an average value was a good way to illustrate the basic concept. That said, a closer look at the distribution of the underlying data points tells the same story: the operating reserves held by Dominion at virtually all 1-minute increments over the last year have far exceeded its minimum requirements – even after accounting for what it holds for solar drops and other contingencies. I'd be happy to provide additional information explaining this point.

RESPONSES TO WITNESS DAVID'S CORRECTIONS

Q. Did you hear the corrections that Mr. David made from the witness stand on Friday August 20, 2021?

A. Yes.

Q. Can you briefly summarize those changes as you understand them?

A. Yes. On Friday, Mr. David made several substantive changes to his testimony from the witness stand. He prefaced these changes as being only 3 minor corrections, all on the same topic. Indeed the first 3 corrections he made (some of which were multipart corrections) all related to the issue of hourly weighting of the VIC to solar production. Specifically, witness David modified his original testimony and study to remove claims that he had used hourly weighting in calculating the VIC charge. While these are significant modifications to Mr. David's testimony, they were changes that I could have anticipated since I had identified the mismatch between Mr. David's original testimony, claiming to use hourly weighting, and his subsequent testimony, in which he said that he abandoned that approach. It remains my position that hourly weighting more accurately captures the impact of solar forecast error on DESC's system.

Q. Were those all the changes Mr. David made?

A. No. There was also a fourth change, and in many ways a much more significant change, that Mr. David made to his testimony, specifically his rebuttal. This change replaced the reference to one set of the workpapers DESC had provided in June (namely the "Guidehouse VIC Calculation

Workbook" which was part of DESC's supplemental response to ORS 1-4) to an entirely different set of workpapers that DESC produced in July (in response to CCEBA 2-14).

Q. What exactly is in CCEBA 2-14 and why it is problematic for the change to have been made?

A. There are six different spreadsheets attached to DESC's discovery produced in response to CCEBA data request 2-14 (versus only two that were included in the originally-referenced Guidehouse VIC Calculation Workbook produced in response to ORS 1-4). The six spreadsheets produced in response to CCEBA 2-14 contain detailed results "[f]or each timestep of the PROMOD runs conducted for the VIC analysis" and include crucial data such as the estimated hourly MW of reserve rhortage and contribution to operating reserves for each generation unit. These data were not included in the spreadsheet Mr. David originally referenced as having relied upon, and which was produced in response to ORS request 1-4.

Q. What conclusion is the new reference to CCEBA 2-14 said support?

A. Mr. David states in his corrected testimony that these workpapers show both that 1) DESC is carrying operating reserves in excess of 250 MW during most hours and, crucially, 2) that there are a relatively small number of hours when the Company does not have excess operating reserves in the base case (i.e., without increased operating reserves). This shortage of reserves in a small number of hours is the underlying driver for the cost to integrate each tranche of solar (i.e., it underpins the fundamental basis for establishing a VIC charge at any level).

Q. Would your surrebuttal have been different if the updated reference to CCEBA 2-14 had been included by Mr. David?

A. Yes. Based on DESC's original testimony, my analysis to date demonstrated that Mr. David's testimony provided no basis for the additional operating reserves said to be required by Tranche 1 solar penetration. Mr. David's reference to a new set of data requires me to update my analysis and surrebuttal.

Q. Do you have a preliminary view on whether Mr. David's changed reference for the basis of testimony would change your conclusions?

A. Yes. For example, Mr. David now seems to be claiming that the newly cited spreadsheet (i.e. CCEBA 2-14) proves that there is a "need to increase available operating reserves in the relatively small number of hours in which the Company does not carry an excess in the Baseline scenario."[1] But the spreadsheets produced in response to CCEBA 2-14 appear to have at least three methodological errors. First, they do not properly account for geographic diversity; second they seem to undercount the contribution of the 576 MW Fairfield Pumped Storage Development to operating reserves; and third they appear to assume an operating reserve requirement for solar that is far above DESC's actual practice in onboarding nearly 900MW of solar.

But those are only preliminary concerns. The spreadsheets produced in response to CCEBA 2-14 were originally downplayed in DESC's rebuttal as just concerning "illustrative examples." Now

[1] David Rebuttal (Original), p 10, lines 5-7.

it is clear that this information is near the core of Mr. David's still-obscure analysis. Additional discovery is needed to fully understand the accuracy, completeness, and significance of this information and how it was used in Mr. David's creation of the VIC.